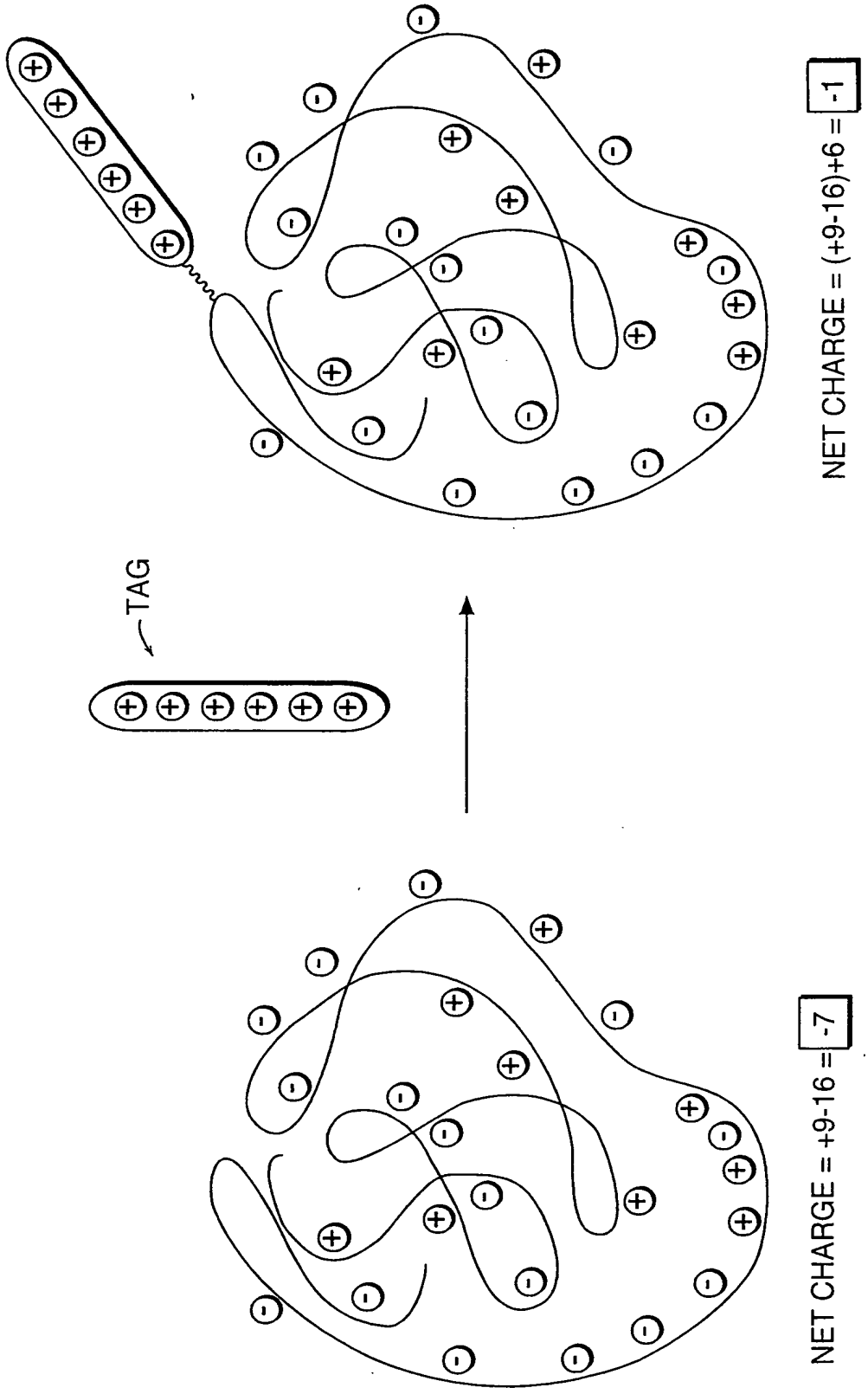


FIG. 1

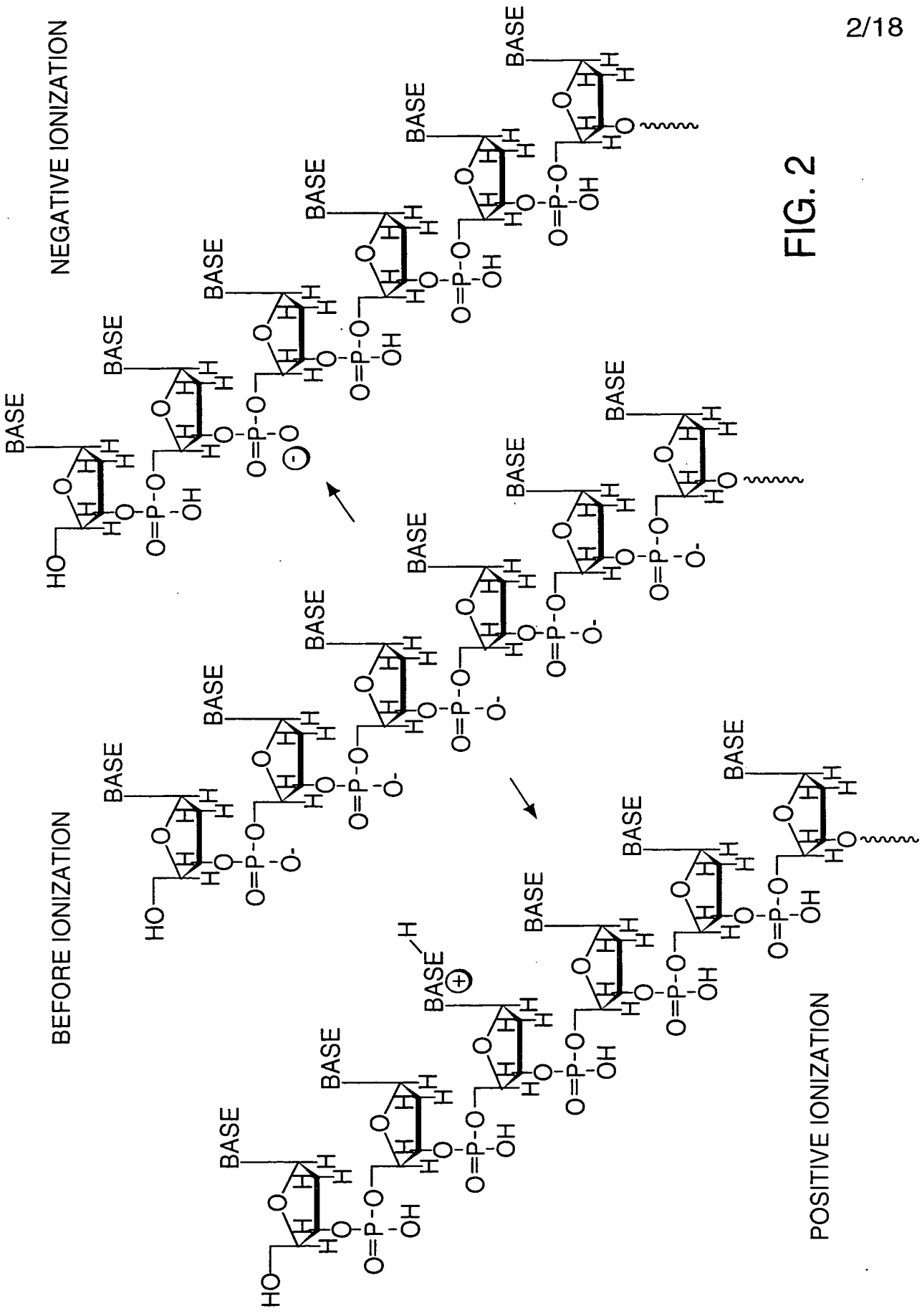

NEGATIVE IONIZATION
BEFORE IONIZATION
POSITIVE IONIZATION
BASE
HO
O=P-O
OH

FIG. 2

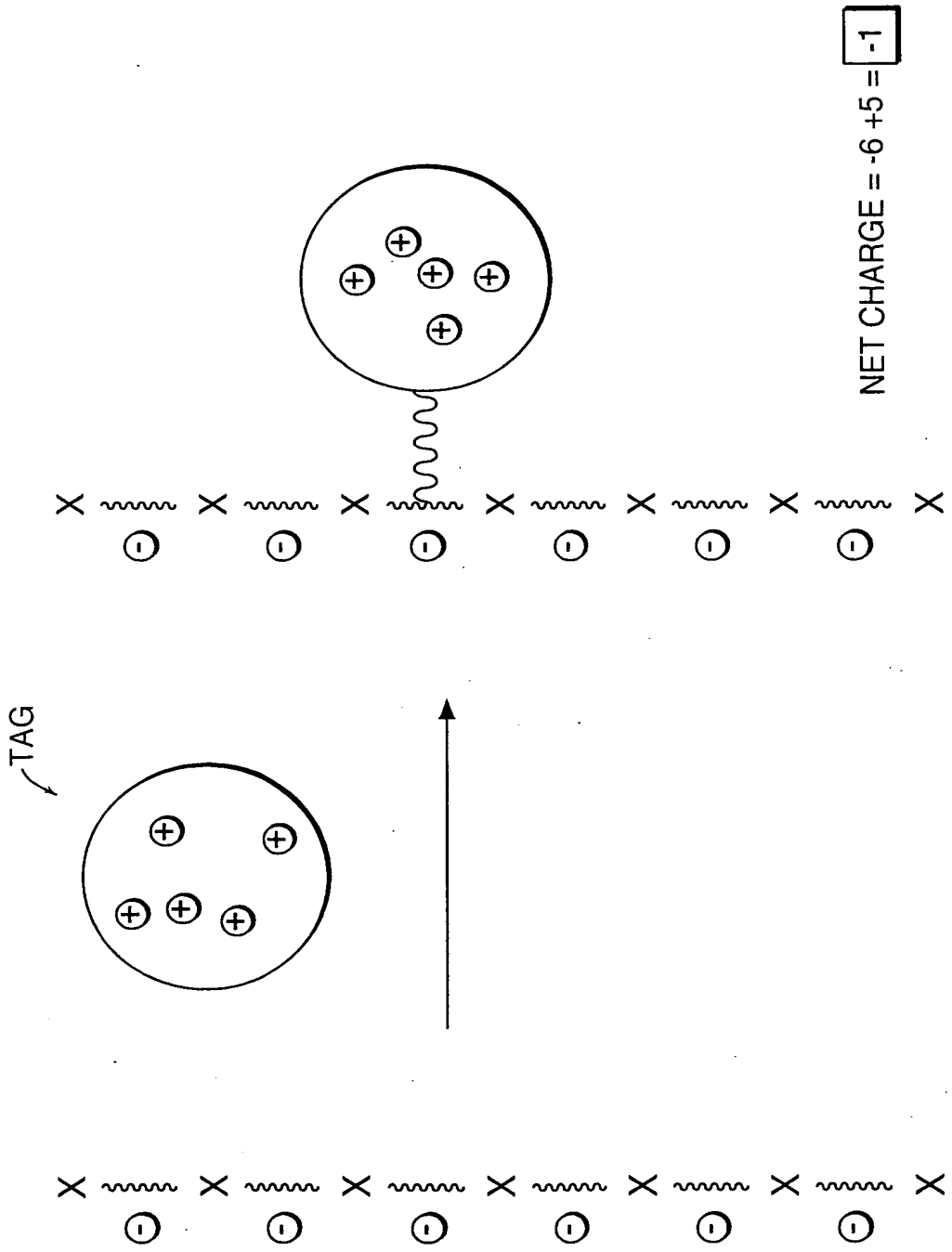


FIG. 3

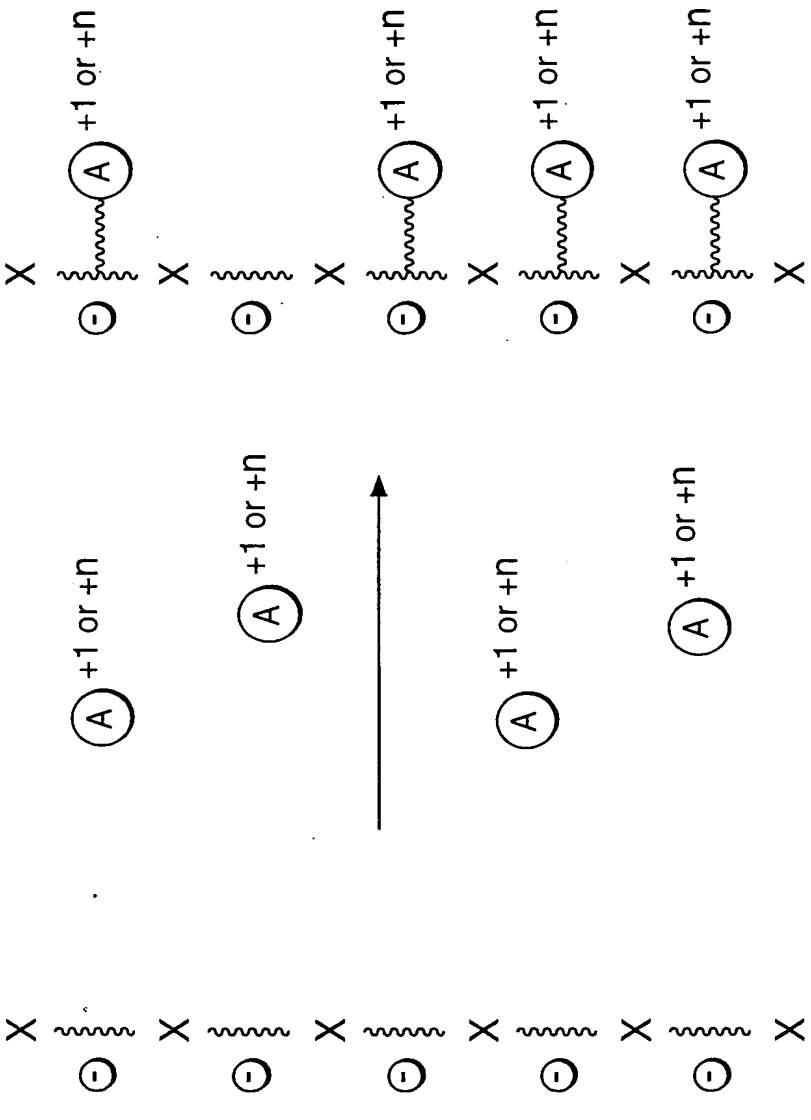


FIG. 4

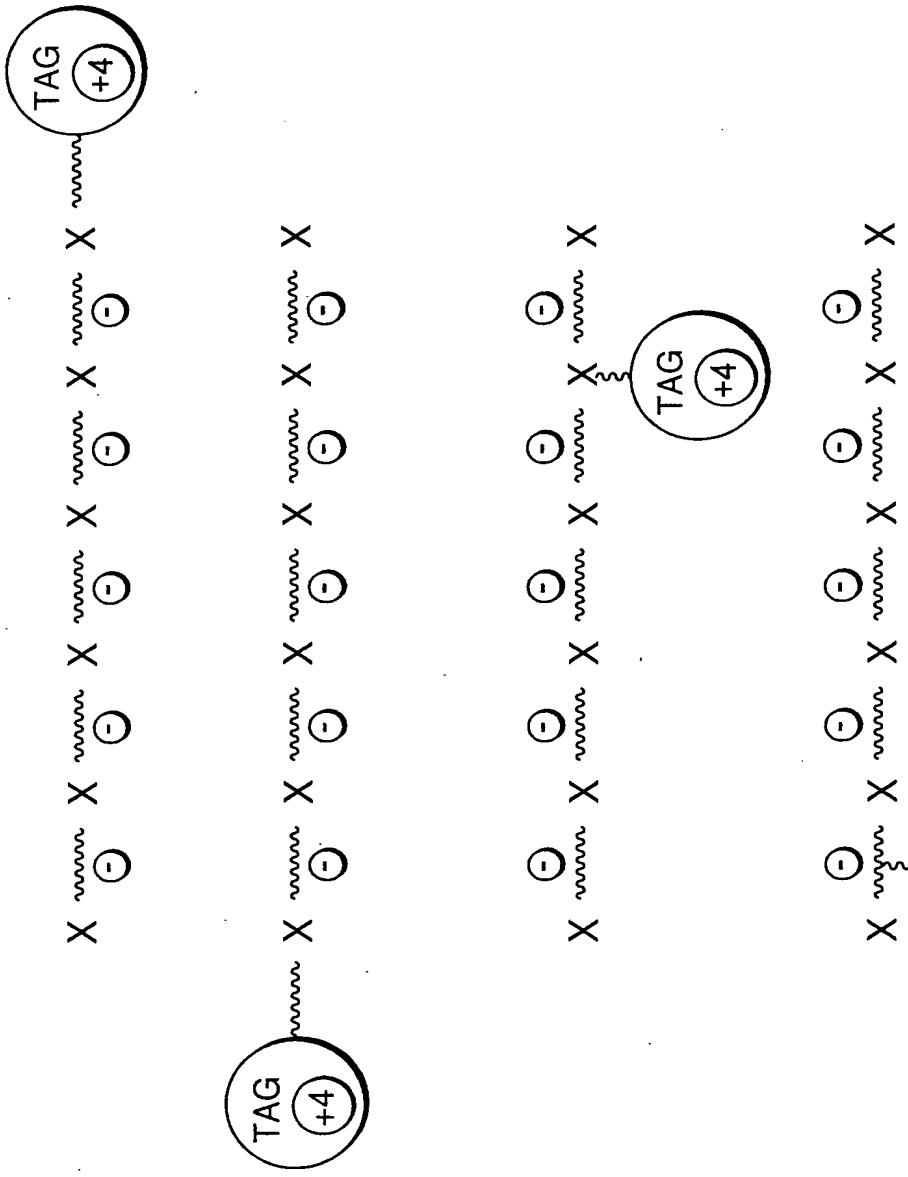
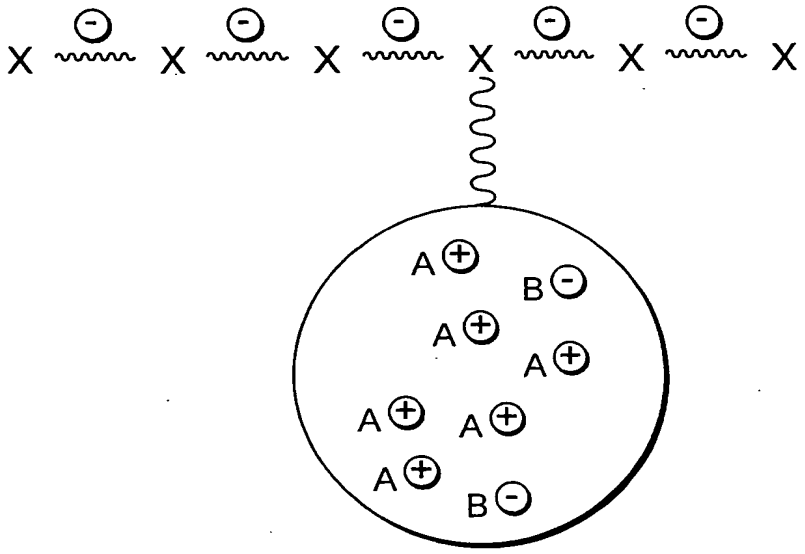
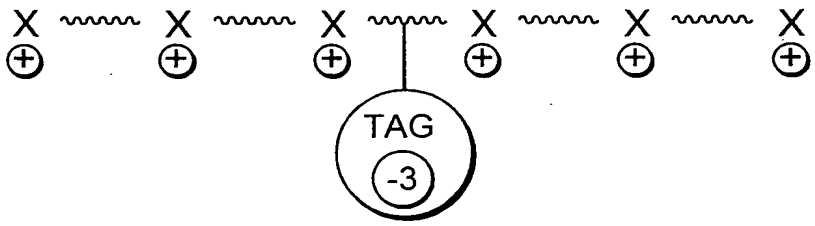


FIG. 5



NET CHARGE = -5 +(+6-2) = -1

FIG. 6



NET CHARGE = +3

FIG. 7

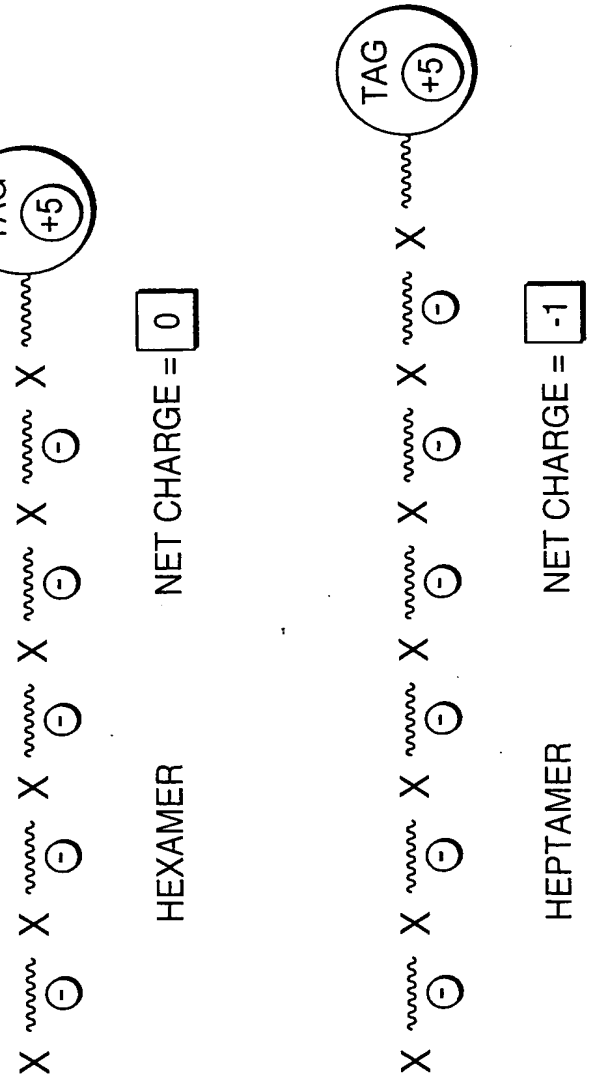


FIG. 8

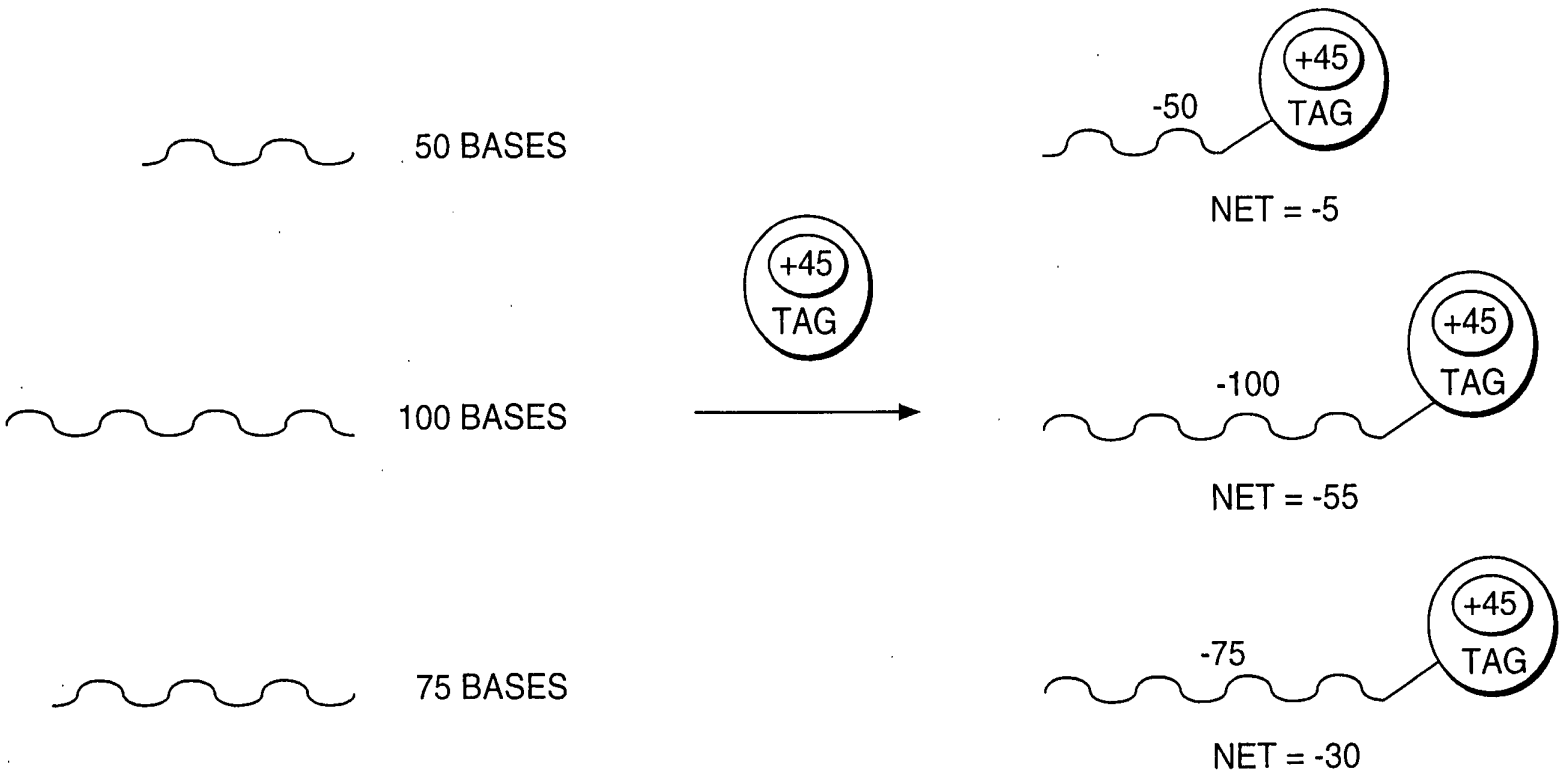

50 BASES
100 BASES
75 BASES
+45
TAG
-50
NET = -5
-100
NET = -55
-75
NET = -30
BEFORE TAGGING
AFTER TAGGING

FIG. 9

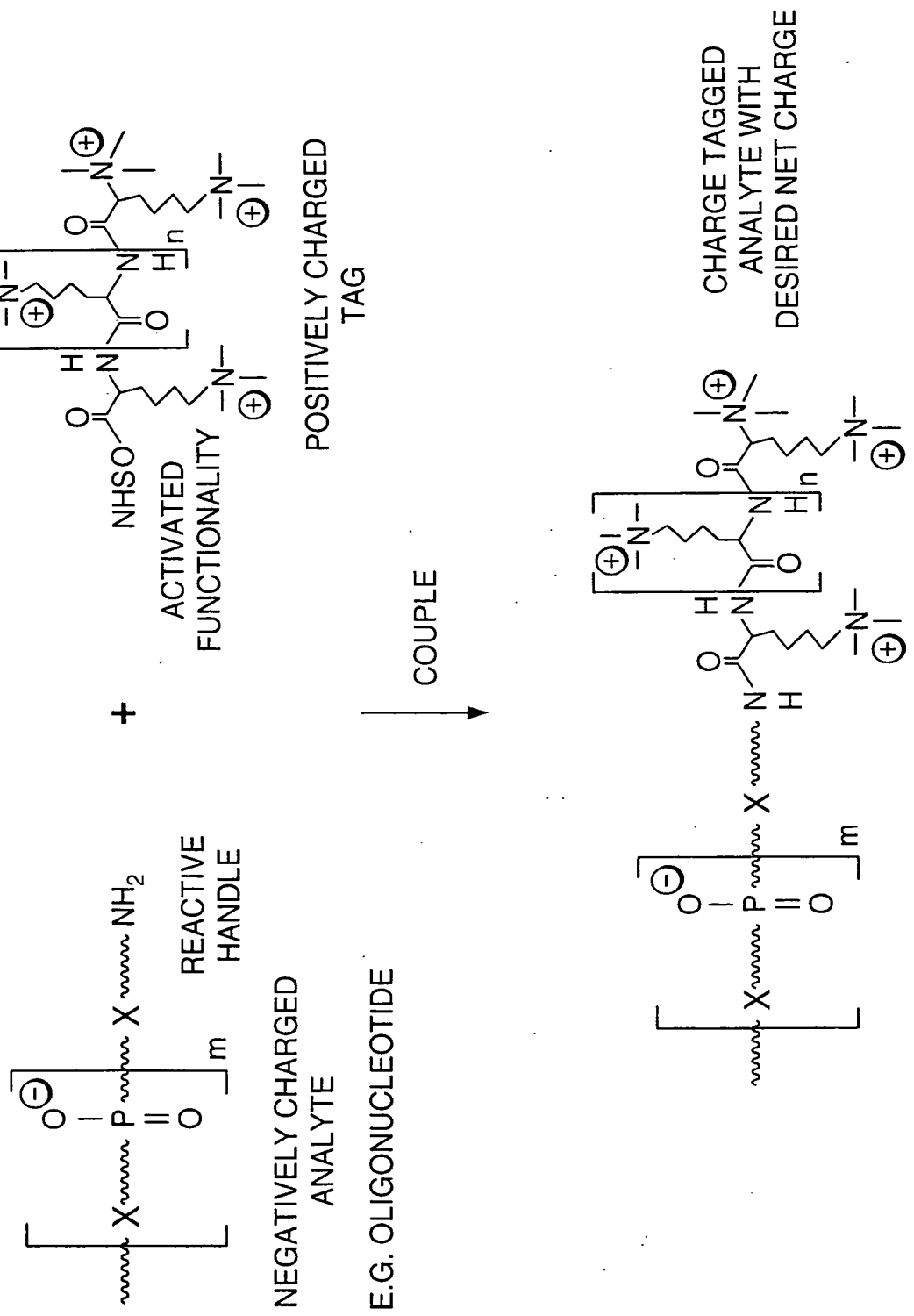

NEGATIVELY CHARGED ANALYTE
E.G. OLIGONUCLEOTIDE
REACTIVE HANDLE
ACTIVATED FUNCTIONALITY
NHSO
POSITIVELY CHARGED TAG
COUPLE
CHARGE TAGGED ANALYTE WITH DESIRED NET CHARGE

FIG. 10

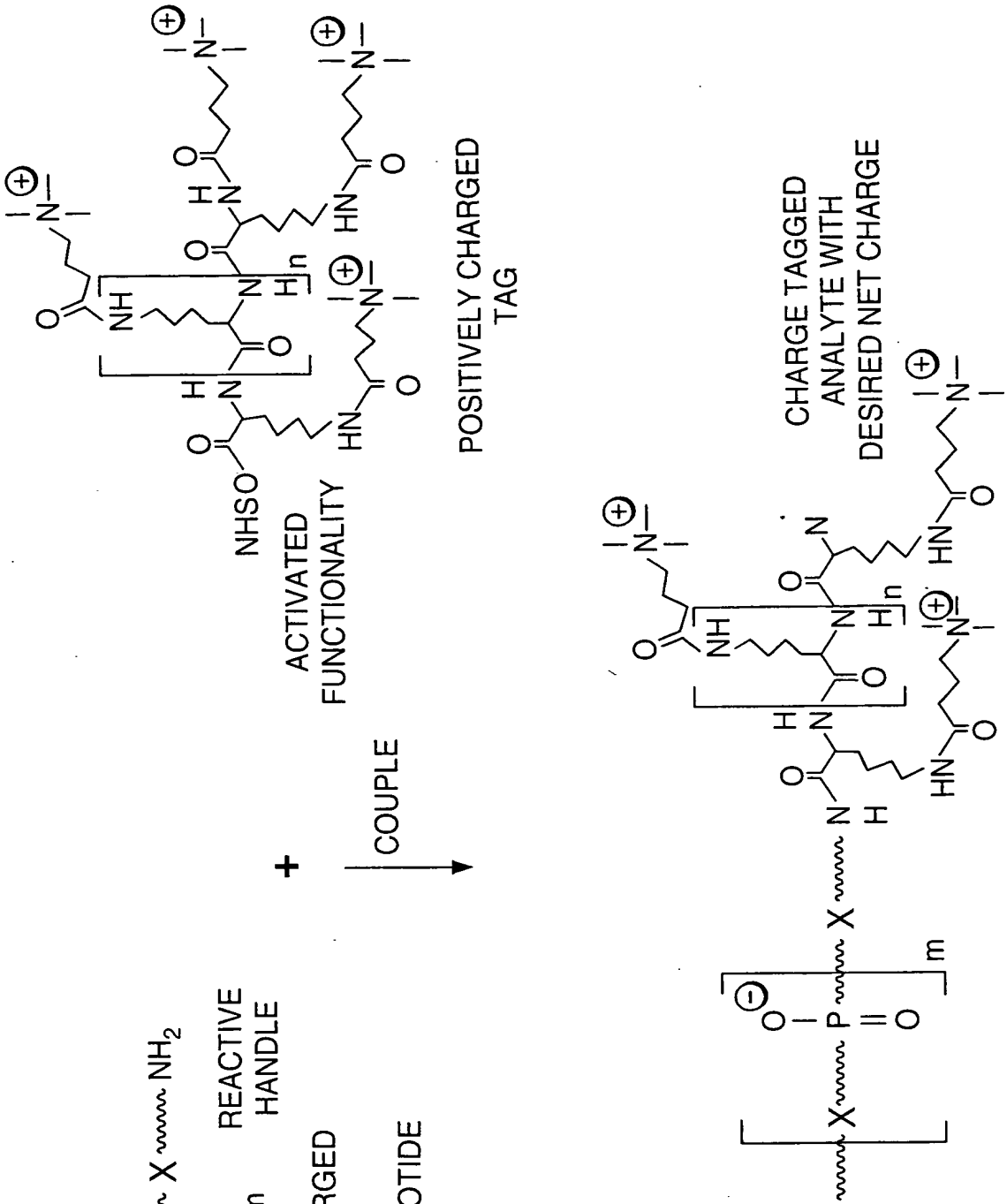

NEGATIVELY CHARGED
ANALYTE
E.G. OLIGONUCLEOTIDE
REACTIVE
HANDLE
COUPLE
ACTIVATED
FUNCTIONALITY
NHSO
POSITIVELY CHARGED
TAG
CHARGE TAGGED
ANALYTE WITH
DESIRED NET CHARGE

FIG. 11

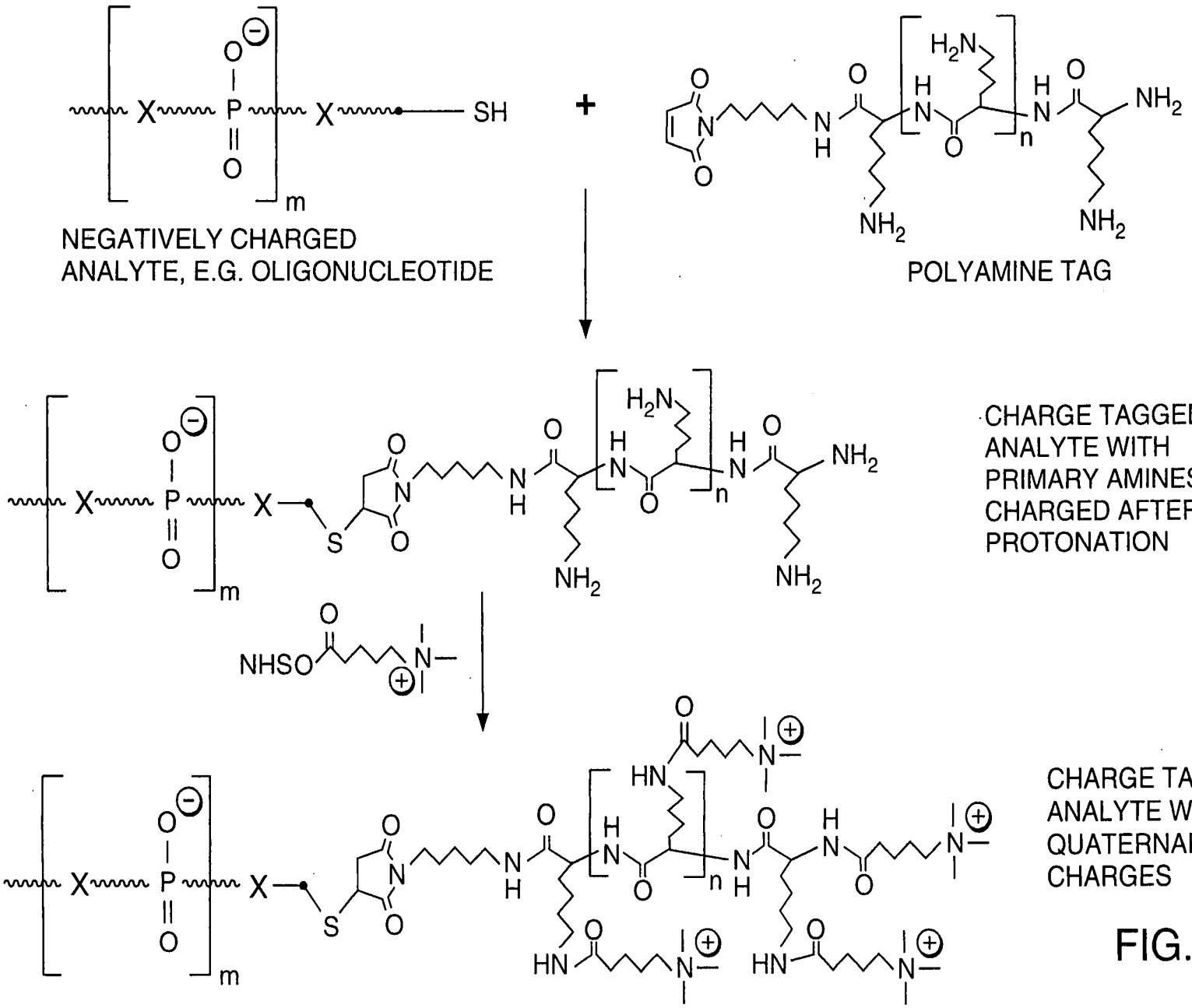

NEGATIVELY CHARGED
ANALYTE, E.G. OLIGONUCLEOTIDE
POLYAMINE TAG
CHARGE TAGGED
ANALYTE WITH
PRIMARY AMINES.
CHARGED AFTER
PROTONATION
CHARGE TAGGED
ANALYTE WITH
QUATERNARY AMINE
CHARGES

FIG. 12

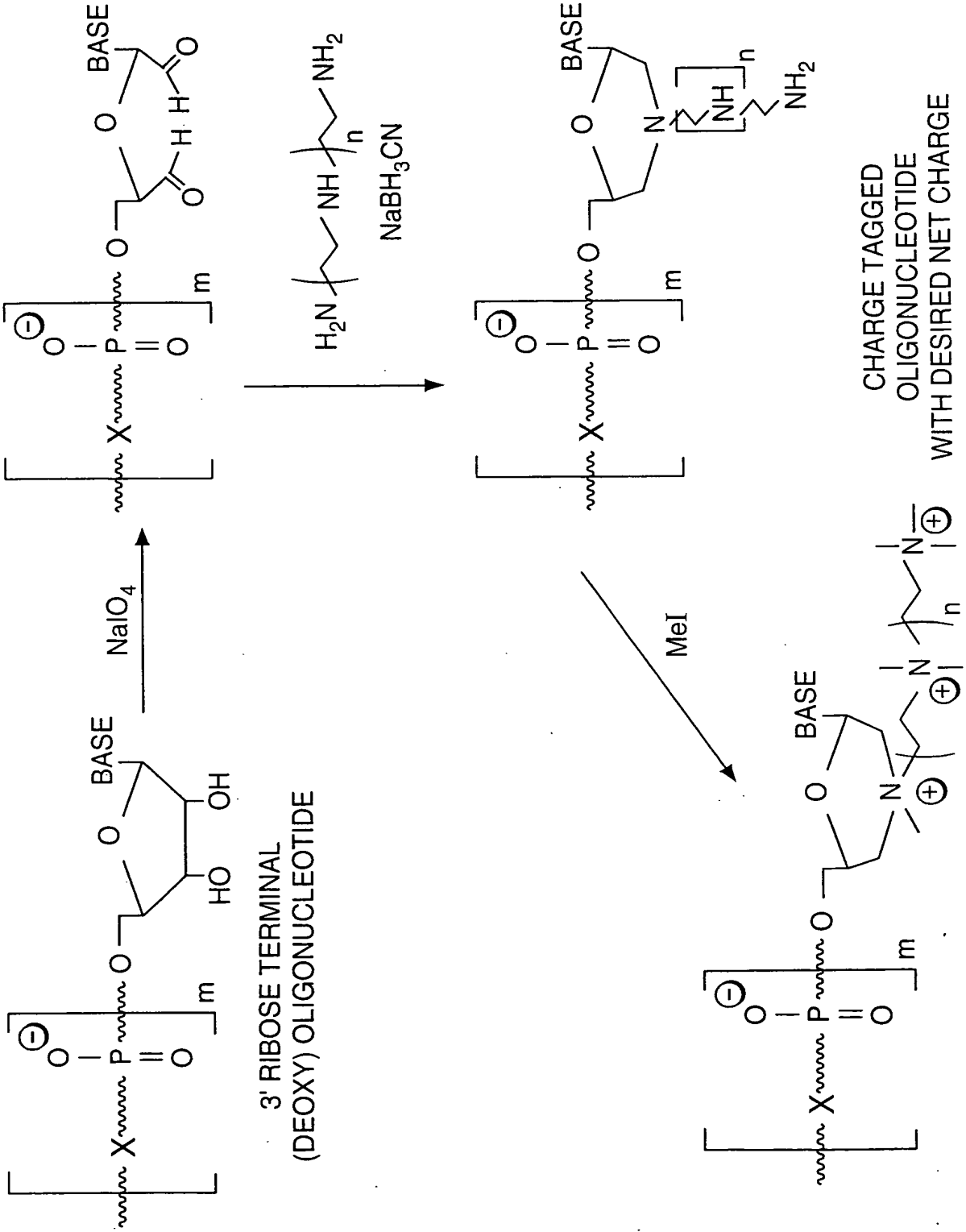

3' RIBOSE TERMINAL
(DEOXY) OLIGONUCLEOTIDE
NaIO4
NaBH3CN
MeI
CHARGE TAGGED
OLIGONUCLEOTIDE
WITH DESIRED NET CHARGE
BASE
OH
HO
NH2
H2N
NH
n
m
X
P
O
N

FIG. 13

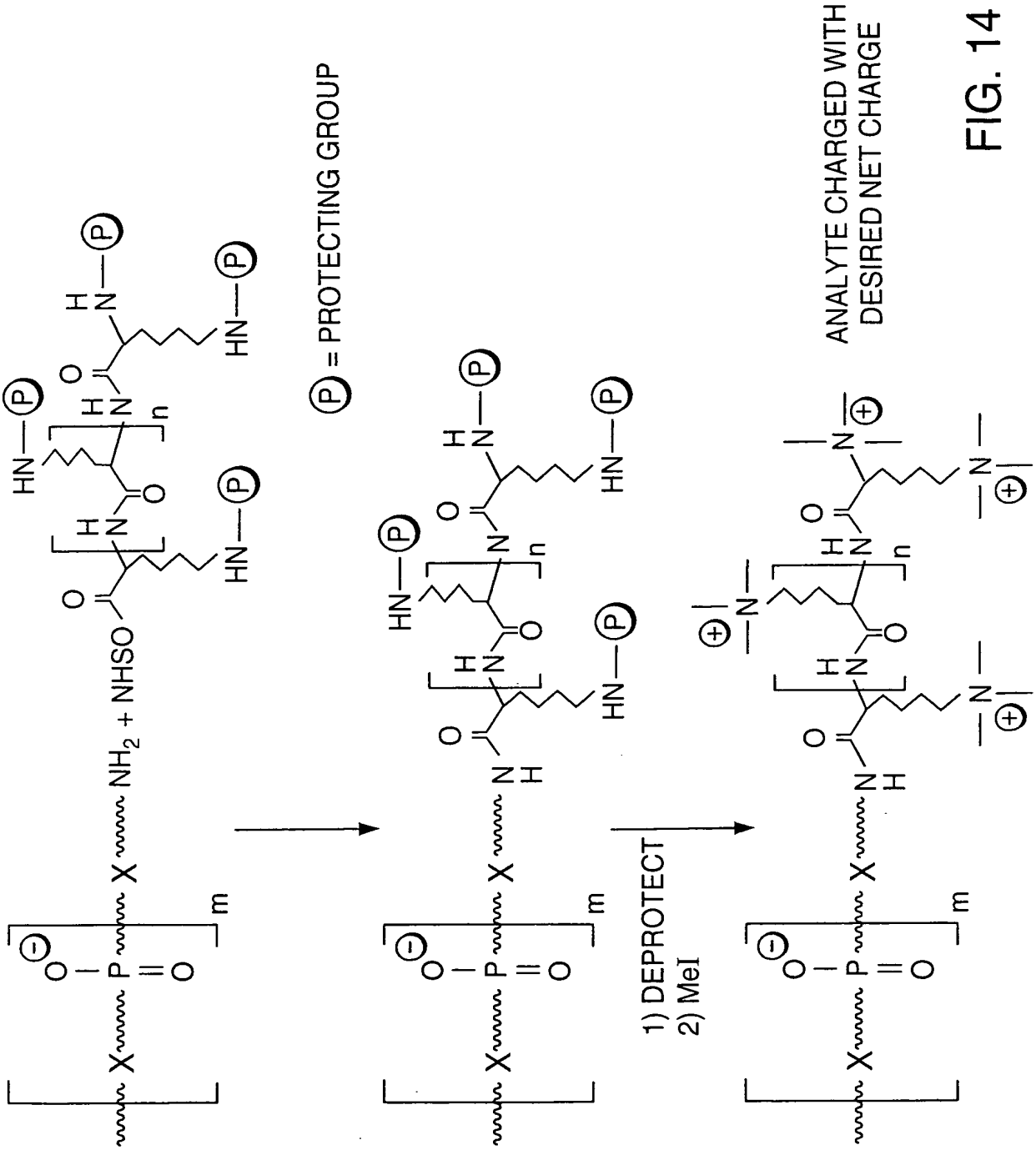

Ⓟ = PROTECTING GROUP
1) DEPROTECT
2) MeI
ANALYTE CHARGED WITH
DESIRED NET CHARGE

FIG. 14

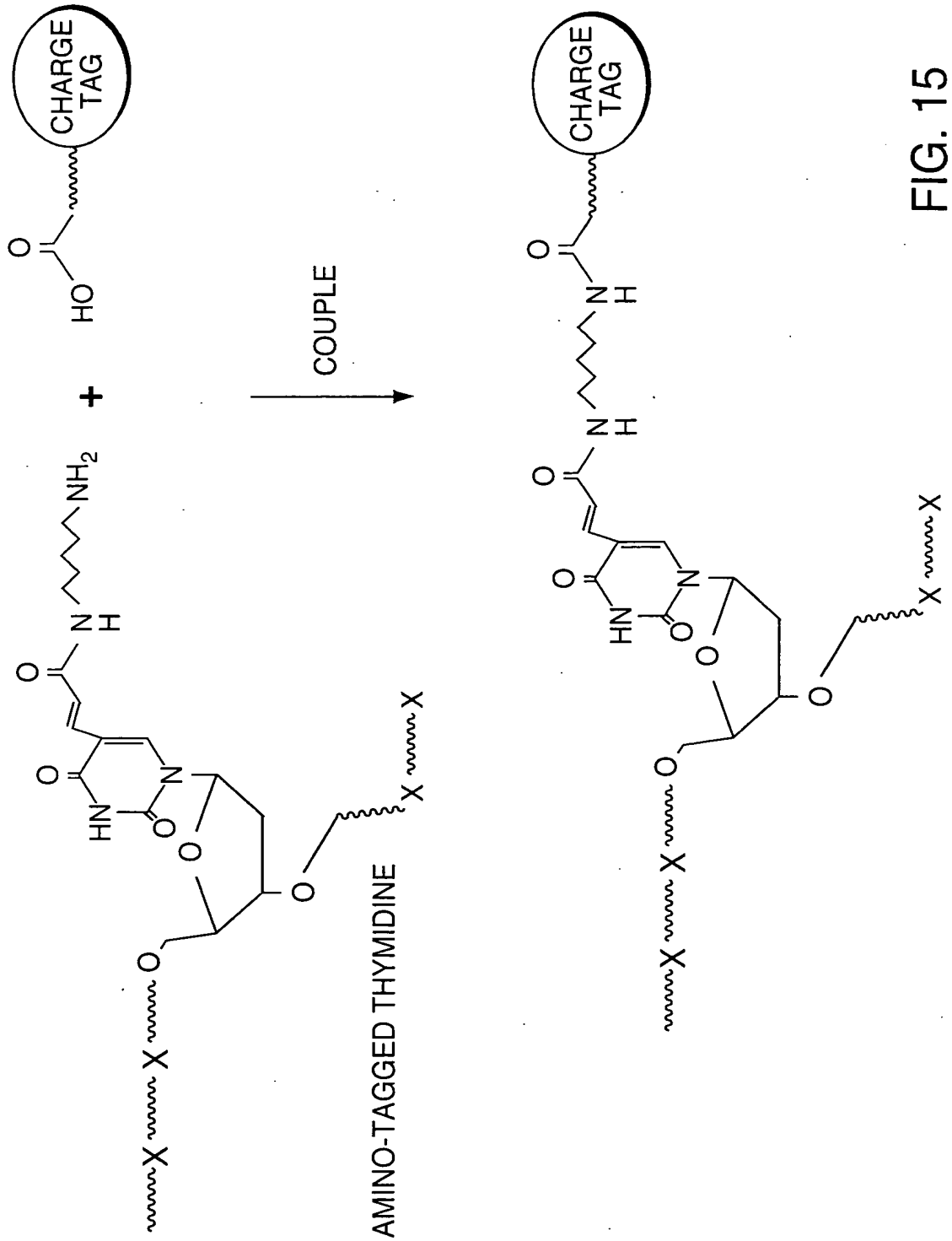


FIG. 15

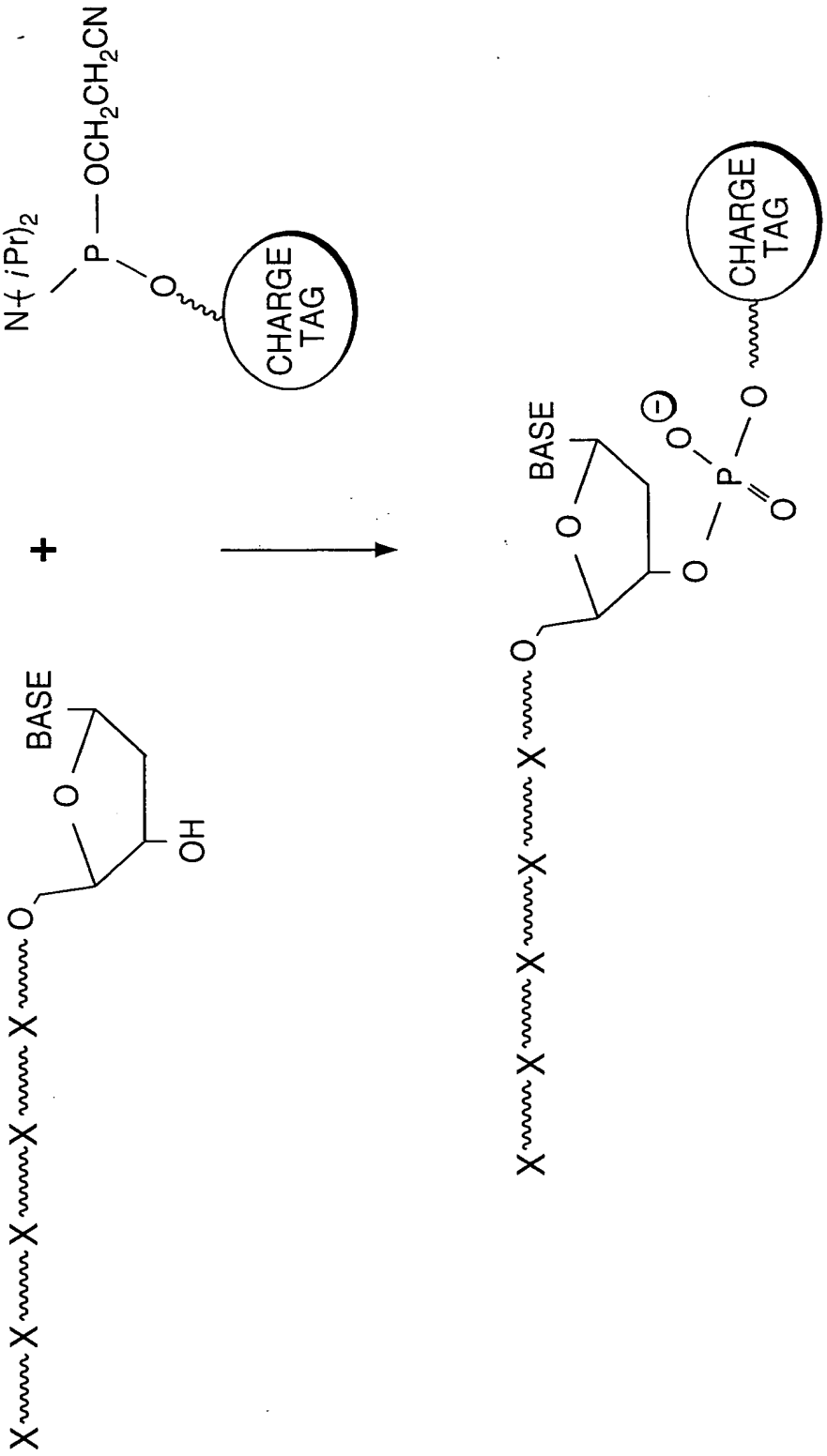

N(iPr)2
P
OCH2CH2CN
O
CHARGE TAG
BASE
O
OH
O
X X X X X X O
BASE
O
O
O
P
O
O
CHARGE TAG
X X X X X X O

FIG. 16

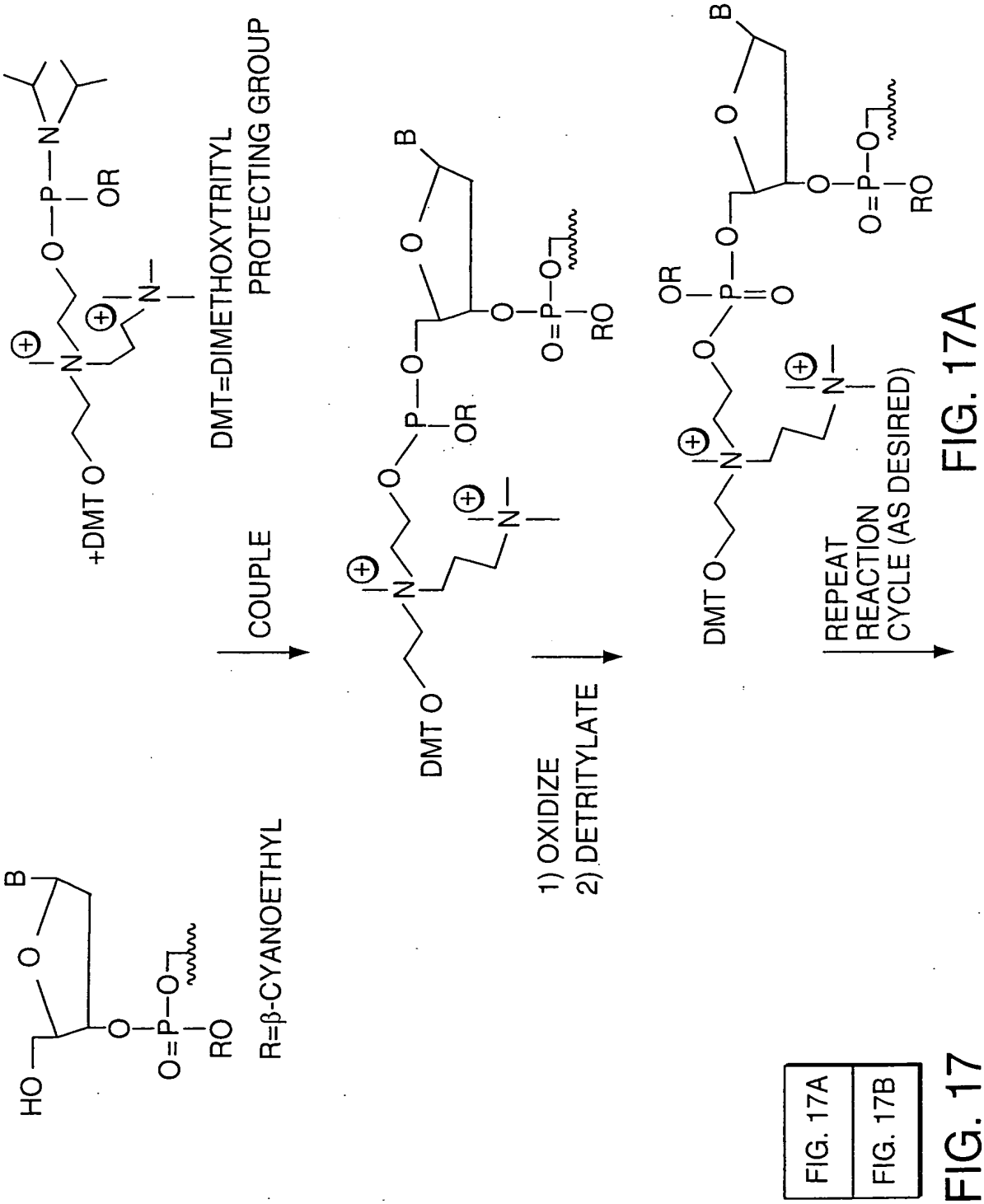


FIG. 17A

FIG. 17A
FIG. 17B

FIG. 17

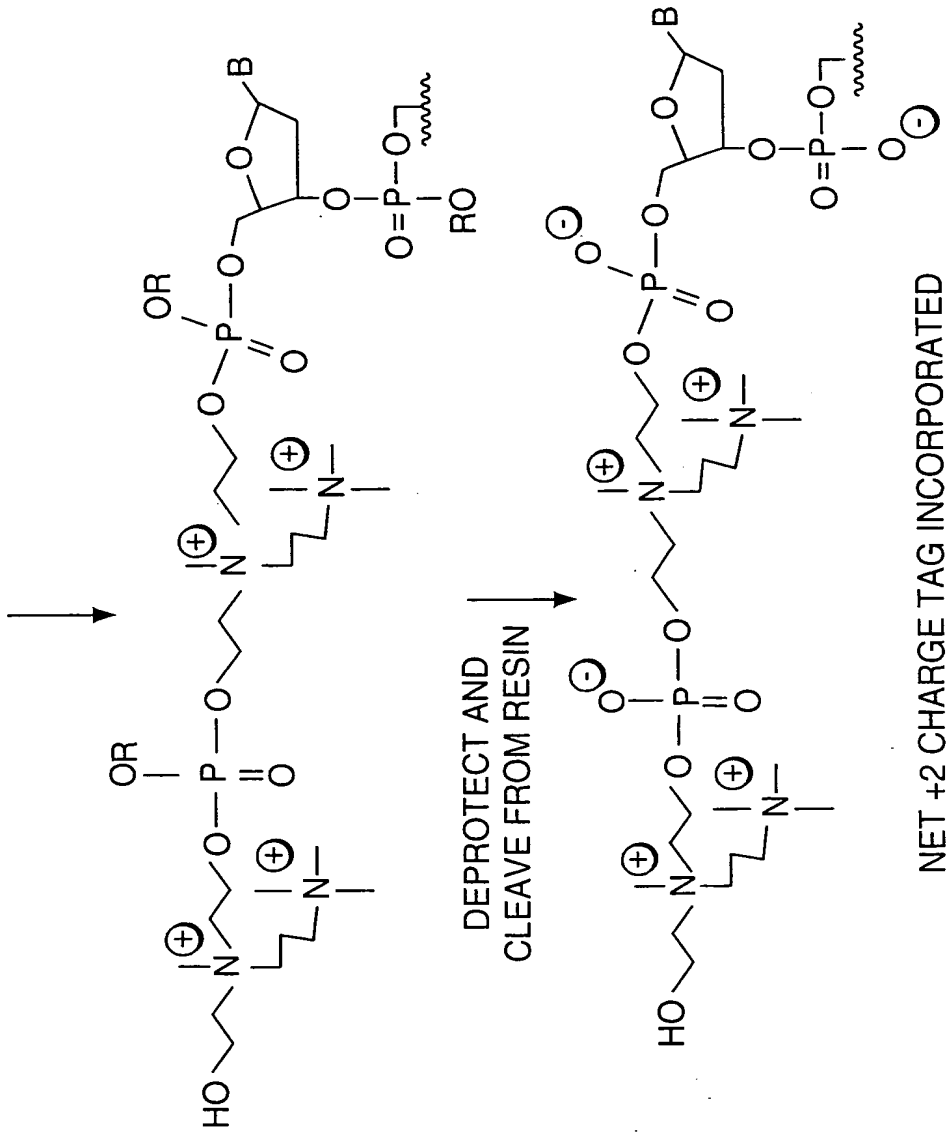

DEPROTECT AND
CLEAVE FROM RESIN
NET +2 CHARGE TAG INCORPORATED

FIG. 17B

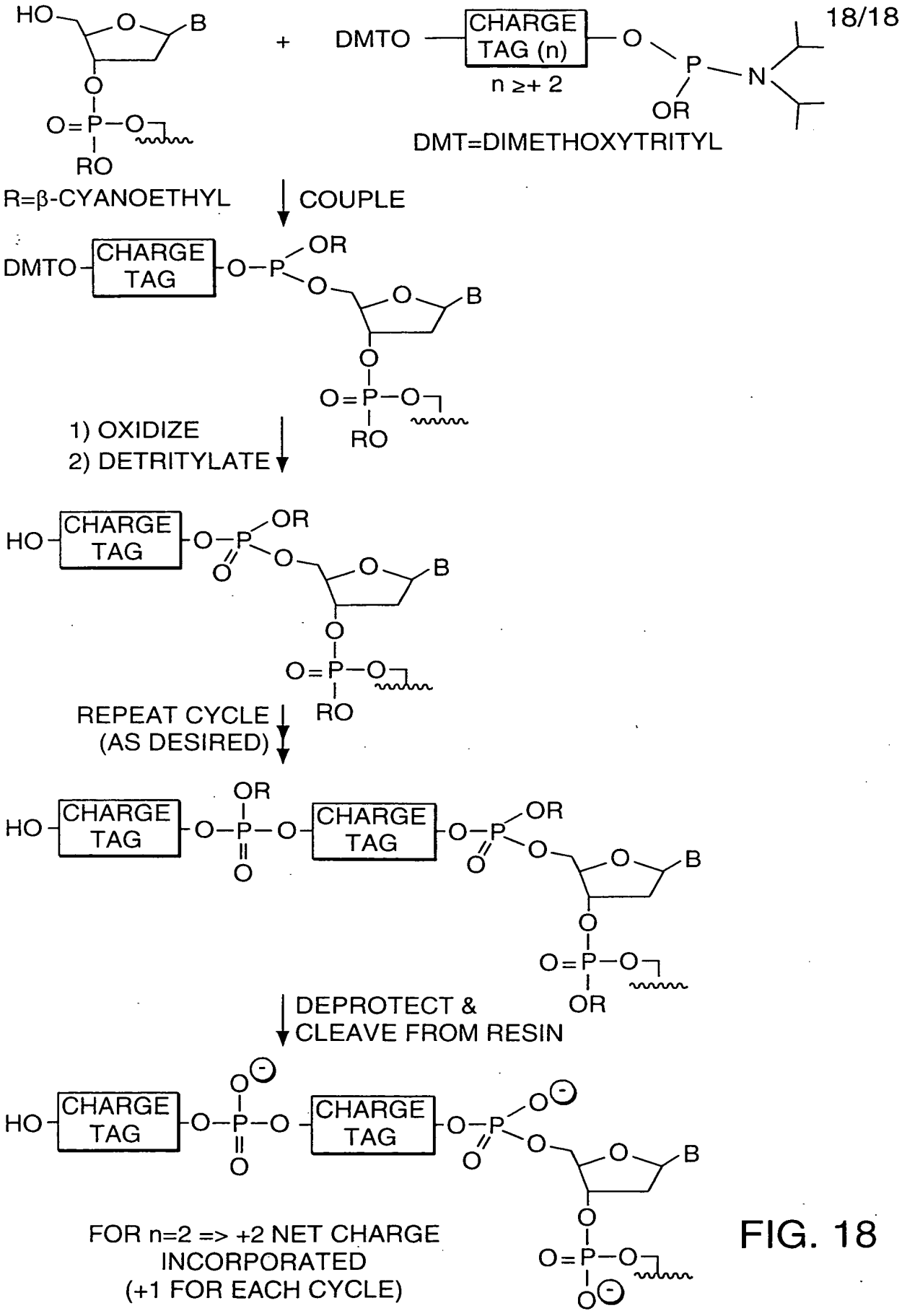

HO
B
O
O=P–O
RO
R=β-CYANOETHYL
+
DMTO
CHARGE TAG (n)
n ≥+ 2
O
P
N
OR
DMT=DIMETHOXYTRITYL
COUPLE
DMTO
CHARGE TAG
1) OXIDIZE
2) DETRITYLATE
REPEAT CYCLE (AS DESIRED)
DEPROTECT & CLEAVE FROM RESIN
FOR n=2 => +2 NET CHARGE INCORPORATED (+1 FOR EACH CYCLE)

FIG. 18